

REMARKS

Status of Claims

Claims 1 and 3-17 were pending in this application, with claims 12-16 being withdrawn from consideration.

In this response, no claims have been amended or cancelled. Applicant has added claims 18-27. These new claims are directed towards the elected claims and are fully supported by the application and do not add new matter. New claim 18 comprises a combination of original claims 1 and 3. New claim 19 is supported by claim 7. New claim 20 is supported by claims 4 and 5. New claim 21 is supported by claim 7. New claim 22 is supported, for example, by Example 1 from the specification. New claim 23 is supported by claim 7. Finally, new claims 24 and 25 are supported by Example 1 and new claims 26 and 27 are supported by Example 2, from the specification.

Accordingly, claims 1 and 3-27 are now pending, with claims 12-16 remaining withdrawn.

In the office action, the following rejections were made:

Claims 1, 3-11 and 17 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 8, 9, 12, 13, 15-17 and 24 of co-pending application no. 11/649,728;

Claims 1, 3-6 and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Komiyama et al. Patent No. 5,118,567;

Claims 1, 3-8 and 17 are rejected under 35 U.S.C. § 102(b) as being anticipated by Noguchi et al. Patent No. 5,476,752;

Claims 10 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Noguchi et al;

Claim 17 was rejected under 35 U.S.C. § 102(e) as being anticipated by Xu Publication No. 2007/0149667, European Patent No. 1,086,403 and Oka et al. Patent No. 6,485,885; and,

Claims 1 and 3-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Xu, European Patent No. 1,086,403 and Oka et al. Patent No. 6,485,885 in view of Knell Patent No. 5,346,933 and Kamen et al. Patent No. 5,656,336.

Applicant traverses all of the above rejections and requests reconsideration of same in

light of the following comments.

Arguments

Double Patenting

Applicant traverses that the claims of co-pending application 11/649,728 and the present application are not patentably distinct. The claims of co-pending application 11/649,728 include a further obligatory feature of a wax component. The present claims have no such feature. Accordingly, Applicant submits that a prima facie double patenting rejection has not been made because there has not been shown or provided a motivation to modify the claims of the co-pending application to arrive at the invention in the claims of the present application.

Notwithstanding same, Applicant will, if appropriate, file a terminal disclaimer once the remaining rejections have been overcome.

Komiyama et al.

The Office Action further holds that claims 1, 3 to 6 and 17 are anticipated by Komiyama et al. (US 5,118,567). Applicant does not agree with the interpretation of Komiyama et al.

Komiyama relates to the problem of fixing semi-conductor wafers during a dicing step and a step of adhering the chips obtained in the dicing step to a lead frame in a die-bonding step, and so in a particularly advantageous way. There is a double use of an adhesive layer: The adhesive layer is radiation curable and by such curing a connection between the wafer and a stretch-able substrate is obtained. The dicing cuttings are then made on the structure, and due to the fact that the coherence between the semi-conductor material and the adhesive layer is better than the coherence between the adhesive layer and the extendable substrate, the individual chips can be lifted from the substrate together with the adhesive layer. At the time of removal of the chips the adhesive layer still carried by the chips is not tacky, so that the chips can be stored in a common container without taking special precaution to avoid sticking together of the chips.

In a later production step the adhesive layer can be activated by applying heat. And by such heating the chips can be secured to the surface of a lead frame regularly spaced from one another.

Regarding the epoxy resin an average molecular weight of from 100 to 1000 is suggested (column 3, lines 57 to 60). The preferred examples 1 and 2 cite a bisphenol epoxy resin having

an average molecular weight of 500 and 900, respectively. Column 4, lines 10 cites epoxy resins the molecular weight of which is between 470 and 2900.

Thus, Komiyama relates to a completely different problem and the specialist not yet in possession of the invention would not consider adhesive tapes used in the production of semiconductor chips when looking for improvements of printing inks.

Furthermore, Komiyama does not disclose all the features of claim 1.

Claim 1 relates to a two component composition, wherein one component is formed by a bisphenol A epoxy resin of a given molecular weight which is diluted in a UV hardening monomer and the other component is formed by a resin having certain functional groups.

The fact that there is a first component formed by diluted bisphenol A epoxy resin is important, since the respective resin is solid and the dissolved resin molecules will evenly distribute in the UV hardening monomer and after curing of the monomer will form discrete islets in the matrix formed by the hardened monomer.

So the claimed composition is different from a known composition that comprises bisphenol A epoxy resin of molecular weight 800 to 1500, UV hardening monomer and the second resin having functional groups. The bisphenol A epoxy resin in the claimed ink does not take part in the cross linking process.

While Komiyama does refer to an epoxy resin, Komiyama does not refer to a UV hardening monomer containing dissolved bisphenol A epoxy resin. Komiyama only discloses a photo polymerizable low molecular weight compound. So the idea of diluting the epoxy resin in a UV hardening monomer is absent from Komiyama.

So claim 1 is not known from Komiyama and the specialist takes from Komiyama no hint as to diluting a bisphenol A based epoxy resin in a UV hardening monomer.

Regarding claim 3, it should be noted that the UV hardening monomer which is part of the first component of claim 1 and the mixture of two resins which have certain functional groups must be kept apart. Claim 3 relates to the second component of the printing ink or printing lacquer, while the photopolymerizable oligomers including functional groups have been held to be an equivalent for the UV hardening monomer of the first component of claim 1.

So when reading claim 3 in connection with claim 1 as required, claim 3 is not anticipated by Komiyama.

Regarding claims 4 to 6, since already the idea of having two main components of the

inks (bisphenol A based epoxy resin diluted in UV-hardening monomer and a resin having free functional groups) is not known from Komiyama, Applicant submits that the claims are not anticipated by Komiyama.

Also, Applicant does not agree with the Office Action's statements regarding the non-relevance of the term ink and the term lacquer in claim 1.

Printing inks and printing lacquers are not just ordinary compositions. The word printing ink and printing lacquer include implicitly certain requirements regarding the viscosity of the ink, the size of eventual pigments contained in the ink, requirements regarding bonding of the ink to a printing substrate and requirements regarding drying or curing of the ink film once applied to the printing substrate.

So to the specialist a printing ink or printing lacquer is not just a composition defined by its components. Consequently, a specialist trying to improve an ink will not consider the field of adhesives.

Noguchi

Applicant also traverses that claims 1, 3-8 and 17 s are anticipated by Noguchi et al. (US 5,476,752).

This reference teaches a radiation curable composition for providing coatings on glass, ceramics, plastic films and the like (column 1, lines 13 to 22). The most important component of this composition is a linear polymer having a glass transition temperature of 50°C or higher and an average molecular weight of 30000 or higher. It is this component which is studied in detail and the preferred embodiments disclose three different species of such long molecules which are referred to under LP-1, LP-2 and LP-3.

None of the examples 1 to 5 relates to a composition which is free from the linear polymer component. Claim 1 of this reference also teaches the linear polymer component as an obligatory component. The same holds for the abstract. Also the somewhat wider language found in column 2, lines 42 to 54 teaches use of the linear polymer component, while a monomer and an epoxy resin may be alternatively used or used together in accordance with this passage.

The man not yet in possession of the invention would never consider omitting the main component of the composition disclosed in Noguchi.

Thus, while Noguchi teaches use of bisphenol A type epoxy resin, the teaching is in a different chemical environment and for different purposes, namely providing a matrix for the LP molecules. Also the passage of column 2, lines 42 referred to above shows that the epoxy resin and a monomer are alternatives for forming a matrix for the LP molecules.

So the specialist would not consider Noguchi disclosing use of bisphenol A epoxy resin having a molecular weight between 800 and 1500 as a component forming islets in a matrix obtained by curing a radiation curable monomer.

Thus Noguchi cannot anticipate the subject matter of claim 1.

Regarding claims 3 to 8, it has not been shown that the claimed subject matter is known from Noguchi. In this connection it should be noted that claim 3 does not cite certain acrylates per se but as (part of) the other resin. Noguchi does not teach a first and a second resin, the first comprising a bisphenol A based epoxy-resin diluted in a UV hardening monomer and the second comprising a resin having certain free functional groups.

Regarding claims 10 and 11 it is correct that Noguchi discloses a photopolymerization accelerator (column 15, lines 63 to 67). However, it should be noted, that already Noguchi makes a difference between polymerization initiators and polymerization accelerators (column 15, lines 60 to 62). Consequently, a co-initiator is something different from a photopolymerization accelerator, the latter increasing the effectiveness of an initiator but being unable to initiate itself, while a co-initiator starts photopolymerization.

Regarding the amount of dyes it should be noted that example 4 of Noguchi relates to a composition that is used in dicing semiconductor chips from semiconductor wafers. So the amount of dye chosen in this example is appropriate for the purpose envisaged and the specialist has no reason to increase the amount of dye.

The Office Action fails to present detailed arguments regarding claim 17 and Noguchi.

Xu, EP 1 086 403 and Oka et al.

Applicant traverses that Claim 17 is anticipated by Xu (US 2007/ 0149667 A1), EP 1 086 403 and Oka et al. (US 6,485,885).

1. US 2007/ 0149667 A1 (Xu)

Xu discloses a composition for use in rapid prototyping by selective hardening of thin layers of the composition using a NC-controlled laser beam.

The composition taught by Xu comprises two different epoxy- components, namely one or more aromatic epoxides and one or more aliphatic epoxides. The compound is further characterized by certain mechanical properties of the material after full cure.

It is in the context of such a composition that the entire document must be read. The present invention does not refer to both aromatic and aliphatic epoxides being present, and so already for the basic concept of the compounds there is a significant difference between Xu and the invention.

2. EP 1 086 403 (Pang et al.)

EP 1 086 403 B1 (Pang et al.) relates to a radiation curable composition for use in stereo lithography, *i.e.* radiation controlled rapid prototyping. The general requirements that prototyping compositions must meet are mechanical strength, high sensitivity for the radiation employed, high mechanical stability and good high temperature performance.

These properties differ from the requirements that inks must fulfil: Good bonding to a printing substrate, high flexibility of the cured film, low viscosity for good printability.

So a specialist concerned with improving the quality of a printing ink would not consider the fields of prototyping compositions.

The technical object of Pang is to improve the high temperature performance of a prototyping composition.

To this end Pang suggests a composition having an epoxy-component including an alcohol having at least three epoxy groups and an alicyclic epoxide with at least two epoxy groups and an epoxy equivalent weight between 80 and 330. Further components of the proposed composition are provided for radiation curing including a photopolymerizable reactive or unreactive diluent. The document must be read in this context.

The component of the composition formed by the alcohol having at least three epoxy groups and the alicyclic epoxide having at least two epoxy groups and a molecular weight between 160 and 660 are considered the origin of the desired mechanical properties of the cured

product, namely high temperature performance, wet recoatability of the liquid composition and improved sidewall finish of the cured article (page 10, lines 43 to 47).

Thus, Pang et al. cannot anticipate claim 17, since there is an additional component comprising alcohols having at least three epoxy groups and an alicyclic epoxide having at least two epoxy groups.

3. US 6,485,885 (Oka et al.)

As may be seen from the title of Oka et al. this reference relates to a thermosetting resin composition. From various passages of this reference it is clear that what is actually aimed at is a photoresistant composition. So line 20 of column 1 and lines 58 to 61 of column 23 relate to developing of a latent image formed in a coating by irradiation through a mask. In the production of the resin film a thermal curing step is required, which will result in cross-linking between carboxylic acid groups of component (A) and the epoxy component (D).

Such thermal curing step is not necessary in forming films from a printing ink or printing laquer in accordance with the present invention.

So, while Oka et al. cites some of the components referred to in claim 1, it does not disclose a printing ink including bisphenol A based epoxy resin diluted in a UV hardening monomer.

Xu, Pang or Oka et al. in view of Knell or Kamen

Applicant traverses that claims 1 and 3-11 are unpatentable over Xu, Pang or Oka et al. in view of Knell or Kamen.

1. US 5,346,933 (Knell)

Knell (US 5,346,933) discloses a thermo-settable ink for glass, ceramic and other hard surfaces. The composition needs a thermal curing step which typically is at 400° F. As pointed out in the specification of this application, the ink in accordance with the invention does not need a thermal curing step. It is sufficient to harden the UV hardening monomer by exposure to actinic light, *i.e.* UV-light.

The known ink may also contain a reactive or non-reactive diluent. However, these are

not UV curable. The composition must rather be cured at temperatures of 400° F for 20 minutes, the curing agent being also a solid substance having a melting point at 405° F (cf. Data sheet). So the entire composition taught by Knell is basically different from the composition taught by Komiyama, Xu, Oka et al. and the specialist would not envisage to use one component (bisphenol A epoxy resin) proposed by Knell in one of the four aforementioned patents.

Thus, claims 1 and 3-11 are not obvious in view of Knell.

2. US 5,656,336 (Kamen et al.)

Kamen et al. (US 5,656,336) discloses printing inks for decorating glass and other vitreous objects. The composition includes two bisphenol A type resins, one of which is in solid form and the other of which is in liquid form. The composition further includes a photo initiator, eventually pigments and eventually additives. It is suggested to use a solid bisphenol A epoxy resin having an epoxide equivalent weight of 400 to 600, corresponding to a molecular weight of 800 to 1200.

Kamen et al. also discloses use of silanes having functional groups. However, such silanes are used as an adherence promoter and not as a second resin component.

Thus, claims 1 and 3-11 are not obvious in view of Kamen et al.

3. Summary

The Office Action recognizes that Xu, Pang and Oka et al. do not exemplify the claimed bisphenol A epoxy resin having an average molecular weight of 800 to 1500 and argues that this feature can be taken either from Knell or Kamen et al.

However, Knell relates to a printing ink that must be heated to about 220° F to be printable. It is in connection with such an ink that the resin EPON 1001 F is mentioned. The curing temperature of the ink is at 400° F. So EPON 1001 F has been disclosed in a particular environment including the further epoxy resin EPON 828 and the dicyandiamide curing agent AMICURE CG-1400, which in accordance with a product sheet has a melting point of 405° F.

In the cured known film there is a continuous layer of thermally cross linked epoxy resin molecules. In a cured film obtained from an inventive ink or lacquer there is a continuous matrix formed by UV cured monomers and the epoxy resin molecules are evenly distributed in this matrix their thermally curable groups being preserved.

The films obtained being different, the compositions themselves must also be different.

Again it does not follow to pick one single component from a known ink composition and use it in a composition of quite different basic structure.

The same holds for Kamen et al. According to Kamen et al. there is a mixture of liquid and solid epoxy resins. These are used in connection with specific photo initiators. Without knowing the present invention the specialist would not envisage to select from the components of the composition in accordance with Kamen et al. just one component for use in Xu, Peng or Oka et al.

Accordingly, Applicant submits that the combination does not provide a prima facie obviousness rejection and are an unallowable hind-sight approach.

New Claims

New claim 18 materially corresponds to the combination of claims 1 and 3 but has been written in independent form. Claim 18 cites a UV curing monomer and a second resin, which are two different substances.

Consequently a component of a known composition (epoxyacrylate of Komiyama, column 4, line 33) cannot be the UV hardening monomer as well as the other resin.

The material arguments set forth above equally apply to this claim.

In addition, Pang, does not refer to a second resin as set forth in claim 3 nor do Knell and Kamen.

Accordingly, Applicant submits that claim 18 is allowable.

Claim 22 has been drafted so as to emphasize that the second resin is different from the first resin and the UV curable monomer.

Claim 23 has been drafted to exclude epoxyacrylate in relation to section 4 of the office action, according to which epoxyacrylate can be at the same time the UV curing monomer and the second resin.

Claims 24-27 relate to the preferred embodiments of the invention described on pages 17 and 19 of the specification. The cited prior art does not anticipate these specific compositions.

Accordingly, for the reasons above, Applicant submits that claims 1, and 3-27 are patentable over the prior art of record.

CONCLUSION

In view of the above, it is submitted that the present application is in condition for issuance and a notice of allowance is respectfully solicited.

If any additional fees are required with this correspondence, the Commissioner is authorized to debit our Deposit Account 50-0545.

Should anything further be required, a telephone call to the undersigned at (312) 226-1818 is respectfully solicited.

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Respectfully Submitted,

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